Government of Saskatchewan

# Annual Report 1983 - 84

## Saskatchewan Energy and Mines

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Government of
Saskatchewan

# Annual Report
# 1983 - 84

## Saskatchewan
## Energy and Mines

for the fiscal year ending
March 31, 1984

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# Letters of Transmittal

The Honourable Frederick William Johnson
Lieutenant-Governor
Province of Saskatchewan

Dear Sir:

I have the honour to submit herewith the Annual Report of Saskatchewan Energy and Mines for the fiscal year ending March 31, 1984.

Respectfully Submitted,

Paul Schoenhals

Honourable Paul Schoenhals,
Minister of Energy and Mines

Honourable Paul Schoenhals,
Minister of Energy and Mines
Province of Saskatchewan

Dear Sir:

I have the honour to submit, for your consideration, the Annual Report of Saskatchewan Energy and Mines for the fiscal year ending March 31, 1984.

Respectfully Submitted,

Bob Reid

Bob Reid
Deputy Minister
Saskatchewan Energy and Mines

# Deputy Minister's Introduction

Increasingly competitive international markets for Saskatchewan produced petroleum and mineral resources provided both challenge and opportunity for Saskatchewan Energy and Mines in 1983-84. Despite the tough international economic environment, a number of new policy initiatives generated provincial success stories, or in some cases planted the seed for future growth.

Before reviewing these initiatives I would like to thank the staff of Saskatchewan Energy and Mines for their outstanding contribution, particularly in the face of record industry activity levels and demand for the development of more responsive government policies. The high calibre of their work combined with their professionalism and dedication contributed greatly to our success as a department in 1983-84.

In 1983-84, the Saskatchewan petroleum industry made a remarkable recovery over the depressed activity of the previous two years. This was due in large part to policy changes implemented in July, 1982. However, further changes were still required in 1983-84 to assist in the recovery.

In response to the OPEC crude oil price reduction in March, 1983, the Government of Canada and Saskatchewan signed an agreement on August 23, 1983 amending the 1982 energy pricing and taxation accord. Conventional old oil prices were frozen and world prices were extended to considerably more of Saskatchewan's production. Saskatchewan also amended its New and NORP royalty schedules as part of the amendment to reflect the pricing change.

As part of the amending agreement, Saskatchewan agreed to participate in a review of the New Oil price (NORP) system, which is the Canadian proxy for world prices. A new NORP system was introduced January 1, 1984. The new system, while far from perfect, did provide a better reflection of international prices and was more responsive to changes in those prices.

In response to the introduction of the royalty/tax holiday program in July, 1982, the industry drilled a record 1,843 oil and gas wells in 1983. The comparative number of wells drilled in 1982 was 809. Record land sales were also recorded with $108 million received in bonus bids for the calendar year 1983 and $124 million received for the fiscal year.

Oil production showed dramatic improvement as a result of the increased drilling activity and strong markets. Production for 1983 was 60 million barrels compared to 51 million barrels in 1982. Due to the industry's exploration and development effort, a net increase in remaining recoverable oil reserves was recorded for the first time in approximately 15 years.

Based on the success of the royalty/tax holiday program, the department announced a two year continuation of the program to the end of 1985. The announcement was well received as drilling in the first quarter of 1984 was nearly double that of the same period in 1983.

The federal government amended its NORP eligibility rules effective January 1, 1984 allowing wells drilled on reduced spacing, as approved by the province, to be eligible for the NORP. This initiative, combined with the province's royalty/tax holiday provisions, provided an incentive for operators to significantly enhance the recovery from certain oil pools.

The cornerstones for long-term heavy oil development were initiated in 1983-84. Saskatchewan Energy and Mines Minister Honourable Paul Schoenhals, unveiled a four point strategy to encourage the development of heavy oil. The development of an attractive fiscal regime was the first step taken. Accordingly, the department embarked on a process to establish new royalties for Enhanced Oil Recovery. The second step supported and encouraged the development of new technology for heavy oil extraction. In 1983, a $30M, five-year, federal-provincial Heavy Oil/Fossil Fuel Research and Development Program was initiated. This program provides assistance to industry by the removal of technical barriers to heavy oil recovery.

The third step established an effective regulatory framework to ensure that extraction of heavy oil is compatible with good agricultural and land use practices and that environmental safeguards are in place. A two year study was initiated to anticipate and resolve any potential problems before they could occur.

The fourth and most essential step ensured that markets will exist for heavy oil production. Heavy oil upgraders will help assure that there will be firm markets in the future.

In 1983, the province reached agreement with the federal government and Consumer Co-operative Refinery Ltd. to construct a 50,000 BBL/day upgrader adjacent to the existing Co-op refinery in Regina. The project would result in direct investment of approximately $600M and, during construction, would require more than 2,500 direct man years employment. Construction is expected to begin in early 1985 with start-up during the mid part of 1987. The 50,000 BBL/day upgrader would be a major step towards providing an assured market for Saskatchewan crude streams.

In addition to reaching agreement on the Co-op upgrader Saskatchewan Energy and Mines continued its on-going negotiations with Husky Oil Ltd. and the Alberta and federal governments, aimed at reaching agreement on the construction of a second upgrader in the Lloydminster area. Expectations were for an agreement to be signed by mid 1984.

Similar to the oil sector, significant increases in industry activity took place in the natural gas sector in 1983-84. The increased activity was a direct result of Saskatchewan's new natural gas policy in which fieldgate prices and producer netbacks were increased, effective February 1, 1983, to revitalize a languishing industry.

Sales of lands in gas-prone areas represented, in some instances, the largest sales in recent years. The number of gas wells drilled in 1983-84 represented an 18-fold increase over immediately previous drilling levels.

With the signing, in March 1984, of the TCPL/SPC Agreement to back out some Alberta imports, major new market room became available for Saskatchewan gas. As a result, Saskatchewan intends to double production by 1987-88 over 1982-83 levels — and hence the new production objective is to reach two-thirds self-sufficiency by 1987-88. Beginning in November 1984, SPC will contract for further supplies in each year to meet the new production objective. This contracting will give Saskatchewan an opportunity to develop a part of the reserves which have long been known and remained undeveloped, particularly in the Hatton area.

Benefits to Saskatchewan from the TCPL/SPC Agreement will include additional royalty revenues and the spinoff benefits of employment, investment and increased income.

A significant improvement in the potash market occurred in the fiscal year. Compared with the previous year, the volume of domestic sales increased 63 percent and offshore shipments by 51 percent. However, prices did not recover accordingly, resulting in the overall profitability of the industry remaining below average.

Discussions with industry representatives continued throughout the year to develop a replacement tax system for the Potash Resource Payment Agreements which expire June 30, 1984. Consultation with industry was facilitated by the Saskatchewan Potash Producers' Association, incorporated in June 1983 with headquarters and office staff located in Regina.

Spot market prices for uranium continued to show volatility, reaching temporary highs in mid-1983 but declined to a new low at the end of the fiscal year. Key Lake, the western world's largest uranium mine, came on stream in late 1983. Full design capacity should be attained early in the next fiscal year, when Saskatchewan will be producing about 60 percent of the Canadian total.

Although uranium exploration expenditures have decreased steadily in the past several years, it is estimated that $27 million was spent in northern Saskatchewan in calendar 1983 which accounts for about two-thirds of total Canadian exploration expenditures for uranium.

Activity in base and precious metals exploration, particularly for gold, showed a significant increase over the previous year. At the end of the fiscal year work was well advanced on development of the Bootleg Lake deposit of Flin Flon Mines with production slated for late 1984. A number of other deposits, particularly in the Waddy Lake area, underwent delineation drilling and feasibility studies.

In an attempt to further stimulate efforts in the base and precious metals sector, a Mineral Industry Recovery Program was introduced in March 1984. The program consists of tax concessions, regulatory changes and a geoscience support program.

A new Mineral Taxation Act (1983) was introduced to consolidate and simplify existing taxation and administrative requirements placed on industry by government. The new act also incorporated new provincial powers for indirect taxation, following from constitution changes agreed to in 1982.

During 1983 a new freehold coal tax was developed in consultation with the coal industry. A new 7 percent ad valorem tax was implemented on January 1, 1984, to replace the existing property assessment-based tax which had proven to be complex and administratively burdensome.

Saskatchewan decided in March, 1984, not to participate in further negotiations with Manitoba and Alberta for the proposed Western Electric Power Grid, which had been deferred for two years in early 1982 to enable utilities in the three prairie provinces to study other energy supply options.

Among the options being considered by SPC for the next energy supply source in 1991 is a long-term purchase of up to 500 MW of electricity from Manitoba, and prospective thermal generating stations in Estevan, Coronach and Grainland.

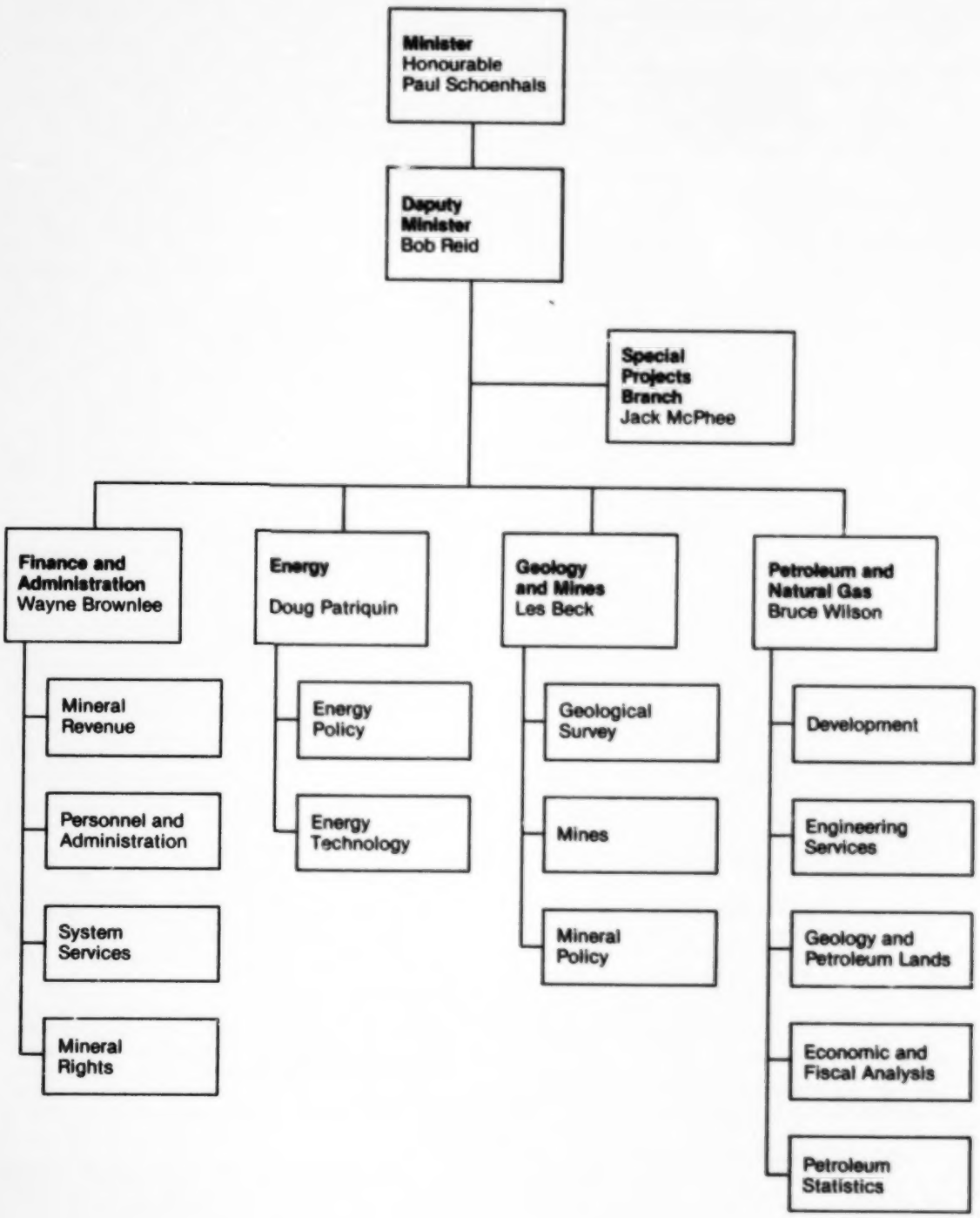
Construction of the $800 million Nipawin hydro project proceeded during 1983-84, with commissioning of the first unit now scheduled for late 1985. Nipawin will have a capacity of 252 MW when completed in 1986, and produce the energy equivalent of 650,000 barrels of oil per year.

Respectfully submitted,

Bob Reid

Bob Reid

# Organization Chart



# Finance and Administration Division

**Wayne Brownlee**
**Assistant Deputy Minister**

The Finance and Administration Division is responsible for mineral revenue collection and audits, internal administration and personnel, legislative co-ordination, communication, mineral rights and system services.

The Finance and Administration Division is now composed of four branches:

- Mineral Revenue
- Personnel and Administration
- Mineral Rights
- System Services

## Mineral Revenue Branch

The Mineral Revenue Branch is responsible for collecting, recording and accounting for the various resource revenues owing to the province. The branch:

- ensures that revenues and accompanying returns and reports are received when due;
- assesses certain kinds of resource revenues on an annual or periodic basis;
- assesses interest and/or penalties on late payments and overdue returns;
- processes revenues through computer and manual systems, as input to financial and management information reports;
- audits resource companies to ensure compliance with taxing legislation;
- maintains historical records of all resource revenues received by the department;
- prepares special reports for use by department officials;
- informs the resource industry of its responsibilities under existing legislation and changes thereto;
- maintains close liaison with other branches of the department on revenue matters.

This branch is divided into two divisions: revenue processing and revenue monitoring. Revenue processing is responsible for maintenance of the tax roll, receiving and recording of revenue, verification and processing of revenue returns, maintenance of computer systems and their interface with other department and government systems, and processing and payment of incentive grants and compensation payments and payments to holders of trust certificates.

Revenue monitoring is responsible for office and field audits in all resource revenue areas, follow-up of delinquent returns, collection of accounts receivable and informing taxpayers of resource taxation legislation. An added responsibility is the administration of the NORP and NOPS supplement programs.

The main objectives of the branch are to ensure that resource revenues owing to the province are received when due, that the amounts paid are correct and properly accounted for, and that data are available on a regular and accurate basis for preparation of financial reports. To attain these objectives, the branch is committed to a continuous program of review and improvement to existing systems and procedures or to the development of new systems.

Other objectives include continued and improved communication with taxpayers and the resource industry, greater involvement in policy decisions affecting resource revenues, and training and upgrading of staff to improve the branch's efficiency. Specifically, staff in the revenue monitoring section have expanded the field audit activity in the oil well income tax area and are stressing the refinement of audit programs and training of audit staff by having each auditor familiar with all resource revenue areas. The branch has also participated fully in discussions related to new powers of taxation as a result of changes to Canada's constitution.

### Legislation

The Mineral Revenue Branch administers numerous acts, regulations and agreements. Among the more significant are:

The Mineral Resources Act
- The Petroleum and Natural Gas Regulations, 1969
- The Oil and Gas Incentive Regulations
- The Mineral Dispositions Regulations, 1961 including Uranium Royalties
- The Delayed Payment Charge Regulations, 1970

The Oil Well Income Tax Act and Regulations

The Freehold Oil and Gas Production Tax Act and Regulations

The Mineral Taxation Act
- The Freehold Coal Tax Regulations
- Regulations pertaining to Mineral Rights Tax

The Oil and Gas Conservation, Stabilization and Development Act

The Potash Resource Payment Agreement

## Revenues

A modest recovery in total resource revenues was experienced during this fiscal year. Decreases in oil and gas and uranium revenue were partially offset by increased revenue from potash and other minerals. Total revenue during 1983-84 amounted to $758.0 million, a decrease of $17.8 million over 1982-83.

| Source of Revenue | 1983-84 | 1982-83 | Per Cent Increase (Per Cent Decrease) |
|---|---|---|---|
| **Heritage Fund** | | | |
| Oil and Gas | $689,129,078 | $701,291,810 | ( 1.7) |
| Potash | 39,702,048 | 36,870,660 | 7.7 |
| Uranium | 11,117,402 | 24,403,388 | (54.4) |
| Other Minerals | 18,069,710 | 13,225,600 | 36.6 |
| Total | $758,018,238 | $775,791,458 | |
| **Consolidated Fund** | | | |
| Mineral Land Tax | $ 3,765,448 | $ 3,762,340 | .1 |
| Interest and Penalty Charges | 2,104 | 20,416 | (89.7) |
| Sales, Services, etc. | 223,680 | 191,801 | 16.6 |
| Receipts from other Governments | 2,469,338 | 939,368 | 162.9 |
| Total | $ 6,460,570 | $ 4,913,925 | |

## Incentives and Compensations

Payments under The Oil and Gas Incentive Regulations during the year were $35 million, compared with $57.8 million in 1982-83. The incentive program is winding down with the phase-out to be completed over the next two years.

Compensation payments to former mineral owners was $2.3 million in 1983-84 as compared to $2.1 million in 1982-83.

Certain mineral rights surrendered to the Crown were encumbered by gross royalty trust certificates. As these lands are leased and brought into production, the branch pays the applicable gross overriding royalty. Payments in 1983-84 totalled $102,389.

| Number of Accounts | Type of Account | Reporting Frequency |
|---|---|---|
| 9,000 | Operator Statements | Month |
| 124 | Net Royalties | Month |
| 6,000 | P&NG Lease Rentals | Annual |
| 50 | Mineral Lease | Month |
| 660 | Oil Well Income Tax | Annual |
| 25 | Compensatory Royalties | Month |
| 25 | Potash | Month/Quarter/Annual |
| 45 | Uranium and Sodium Sulphate | Month/Quarter/Annual |
| 800 | Coal | Month/Quarter/Annual |
| 500 | Quarrying | Month/Quarter/Annual |
| 70 | Salt and Other Minerals | Month/Quarter/Annual |
| 1,000 | Mineral Rights Tax | Annual |
| 110 | Miscellaneous Sales | Month |

# Personnel and Administration Branch

This branch manages the administrative services for the department and its staff. Specific services include personnel, accounts, purchasing, drafting, budget administration, and sales and distribution of the department's publications.

## Personnel Section

This section is responsible for recruitment and selection of department staff, training, organizational development, classification, and advisory services regarding the rights and benefits of employees.

## Accounts Section

All department expenditures including payrolls, expense accounts, purchases and various Heritage Fund expenditures are processed in this section. Financial statements are prepared, historical records maintained and all monies and bonds placed on deposit by companies are held in trust by this section. During the reporting period, consolidated fund expenditures totalled $9,825,831 as compared to $10,428,107 for the previous fiscal year.

### Purchasing Section

Purchasing assists all divisions by ordering supplies and equipment, maintaining a central stockroom and keeping an inventory of all equipment owned by the department. This section liaises with the Central Vehicle Agency to ensure vehicles are available for department business and is directly involved with problems related to telephones and space allocation.

### Drafting Section

This section compiles a large variety of technical illustrations, including polychrome geological and geophysical maps. As well, the section liaises with other drafting units as well as with photo-mechanical and printing firms to ensure quality reproduction of maps and technical reports.

### Publications Office

This section is responsible for the printing, marketing, sales and distribution of department publications, as well as the preparation of materials to support these sales. During the 1983-84 fiscal year, sales of publications totalled $130,787.

## System Services Branch

System Services provides planning, management, consulting and co-ordination support functions for the development of new and the maintenance and operation of existing information systems for the department. This includes responsibility for the evaluation and acquisition of computer hardware and software, data-entry, data security and the development and management of the department's computer services budget.

System analysis, development and maintenance are performed by branch staff or co-ordinated with System Centre analysts. The department currently runs eighteen computer systems on a regular production basis. The applications vary from revenue accounting, royalty simulation and forecasting to production accounting and statistics. Along with the standard application development tools, software packages such as SAS, Mark IV, APL and plotting are used extensively.

The automated processes use a variety of equipment and computers. The branch operates a remote job entry terminal that provides the communications link between the department and SaskComp computers. In addition, six smaller terminals and two micro computers are available for on-line data processing, program development and maintenance.

Two major studies were initiated by System Services in the past year:

1. The feasibility of an automated, comprehensive well information base was analyzed resulting in a three-year plan to develop a well information system. Development work will begin in 1984/85.
2. An evaluation was made of computer hardware and software to support the department's APL processing requirements.

Two other projects were introduced to:

- simplify paper work in the Petroleum and Natural Gas division for oil and gas related processes.
- study the feasibility of acquired computer hardware to accommodate all the systems. The study will be completed in 1984/85.

## Mineral Rights Branch

The Mineral Rights Branch is concerned with mineral land ownership and records. Comprised of three sections, its responsibilities are outlined as follows:

### Mineral Land Ownership Section

- maintains a computerized freehold mineral land ownership base for all taxable parcels of mineral lands that are assessed a mineral land tax;
- prepares and registers all mineral land transfers to the Crown;
- enforces foreclosures under The Mineral Taxation Act;
- interprets and verifies mineral and ownership for various branches of the department and for industry;
- provides historical reviews and data necessary for any legal cases regarding doubtful mineral ownership when the department is involved;
- registers and withdraws caveats that affect Crown mineral lands;
- registers and discharges mechanics' liens filed against Crown mineral land dispositons under The Mechanics' Lien Act.

### Mineral Land Records Section

- maintains a mineral land record of all Crown and freehold mineral ownership, which includes an up-to-date record of all Crown mineral land dispositions in the surveyed area of the province;
- verifies Crown mineral lands available for Crown mineral land disposition sales;
- maintains a record of all Crown mineral lands held subject to various trust agreements. This includes the registration of transfers of the trust certificates and the availability for land disposition sales;
- computes acreage figures for all Crown mineral land dispositions;
- supplies industry upon request, information regarding the disposition or availability of Crown mineral lands;
- verifies mineral land ownership for every well that is licensed.

## Landfile Section

- maintains an up-to-date computerized landfile with data identifying all completed, producing and expired oil and gas wells in the province. Ownership of each well is identified and the data is used in the collection of oil and gas revenues;
- verifies new ownership of mineral lands that relate to producing properties.

## Summary of Activities

The following table indicates the number of forfeitures and transfers completed during the year under review.

| Land Registration District | Forfeitures | Acreage |
|---|---|---|
| Regina | 8 | 724 |
| Saskatoon | 1 | 43 |
| Moose Jaw | 2 | 481 |
| Humboldt | 1 | 320 |
| Prince Albert | 1 | 159 |
| Yorkton | 1 | 60 |
| **Total** | 14 | 1787 |

## Mechanics' Liens

During the fiscal year 121 liens were registered and 14 discharges were recorded under the Mechanics Lien Act.

## Caveats

Twelve caveats were placed against delinquent taxpayers' titles and ten caveats were withdrawn in compliance with The Mineral Taxation Act.

# Energy Division

**Doug Patriquin**
**Assistant Deputy Minister**

The former Policy, Planning and Research Group was reorganized in FY 1982-83 as the Energy Division, comprised of the Energy Policy Branch and the Energy Technology Branch. In addition, the division assumed responsibility for the Energy Conservation Branch while the responsibility for industrial and metallic mineral policy was transferred to the Geology and Mines Division.

The Energy Division conducts research and analysis of policy issues related to energy resource development. Information and recommendations are provided to government to assist in the formulation of policies in areas such as the rate of development of the province's energy resources; the pricing and taxation of energy resources; energy research, development and demonstration activities; and non-conventional and renewable energy sources. The division also carried out negotiations which relate to the National Energy Program with the federal government and other provincial governments.

## Energy Policy Branch

The Energy Policy Branch is responsible for the analysis of policy issues relating to energy resource development. The branch conducts research and assists in the formulation of policy with respect to crude oil and refined petroleum products, natural gas and coal.

Specifically, the Energy Policy Branch:

- conducts financial and economic evaluations and generates policy recommendations with respect to major resource developments and royalty and taxation policies;
- conducts economic analysis and generates recommendations concerning the pricing of energy resources, and provides assessments of the impact on the economy of various energy policies and projects, as well as the impact on the energy sector of various macroeconomic conditions;
- co-ordinates the department's economic forecasts, monitors, evaluates and reports on issues relating to the production, processing, distribution and marketing of energy resources; and
- monitors developments in federal energy policies, develops strategies, prepares briefing and position papers and participates in negotiations with other governments and industry.

Towards the end of the fiscal year branch staff, together with the Geology and Mines Division, undertook a comprehensive review of the provincial uranium royalty system. This included an assessment from both an economic and financial perspective of an alternative tax and royalty system.

The branch provided assistance to the Mineral Policy Branch of the Geology and Mines Division in its review of the Potash Resource Payments Agreements which are due to expire at the end of June 1984. Various alternative tax systems for the potash sector were reviewed from both an economic and financial perspective. The branch also assisted Mineral Policy in its strategic review of Saskatchewan's current and future position as a dominant supplier in the world potash market.

### Oil

The branch participated in the department's negotiations with the federal and Alberta governments on the amendments to the 1981 Energy Agreements. The key provisions of these amendments included the freezing of the COOP and its present level of $29.75/barrel but most importantly, the extension of NORP to not only SOOP production but also to workovers and waterflood production. The results of these negotiations were that a full 60 percent of Saskatchewan production now receives the world price.

The Energy Policy Branch played a key role in the department's discussions with both the federal and Alberta governments on the subject of revising the system of NORP pricing. The results of these discussions were that the new NORP system is much more responsive to world price trends and more accurately reflects the world prices for Saskatchewan's crude production. This is of particular importance to our production of heavy crudes, all of which receive the NORP price.

The branch has assisted the Petroleum and Natural Gas Division in establishing a new royalty system for oil produced through enhanced recovery techniques. These royalties are profit-sensitive in order to reflect the high costs and high risk involved in the extraction of heavy oil through enhanced recovery techniques.

### Natural Gas

The Energy Policy Branch was significant in securing additional market room for Saskatchewan natural gas after establishing a new provincial natural gas pricing/royalty policy in February, 1983. The Saskatchewan and Alberta governments agreed to reduce imports of Alberta gas into Saskatchewan so that more of Saskatchewan's can be brought to market to meet its domestic needs. Saskatchewan's new production objective is to double production in 1987-88 from the 1982-83 level. To facilitate this new objective, SPC entered into negotiations with producers for additional supplies to be delivered in 1984-86, and will be negotiating for further additional supplies effective 1986-88 inclusive.

To aid government planning the branch also prepared economic forecasts for the natural gas industry and forecasts of provincial natural gas royalty revenues.

Designed to stimulate natural gas exploration and development, the policy of February, 1983 resulted in significant increases in industry activity:

- Crown natural gas rights sold in gas prone areas exceeded $8.5 million in 1983-84, by far exceeding sales in recent years.
- 159 natural gas wells were drilled in 1983 compared to 9 the previous year. A similar, if not greater level of activity is anticipated in 1984 to fulfill new contract opportunities.
- Three new producer contracts were signed by SPC in 1983.

## Coal

The branch has an on-going responsibility to assess tax and royalty schemes which may be levied on coal production; to produce updated coal supply, demand, and revenue forecasts; and to prepare briefing materials on various coal related issues.

During the last fiscal year a new ad valorem-based Freehold Coal Tax was implemented. The new tax replaced an economically inefficient and administratively complex property assessment-based tax. Recent changes to the Canadian constitution led to development of the new Freehold Coal Tax. Also during the past year, a review of the Crown coal disposition policy was initiated with a view towards simplifying the existing regulatory framework.

Branch staff also examined the potential for increasing the utilization of the province's large coal resource, while realizing that such increased use may have environmental implications.

## Energy Policy

- participated in the review of prospective resource development projects identified in the Energy Resources Opportunity Study, including the proposed Consumers' Co-op Refinery upgrader, production of potash-based fertilizers, and an ammonia plant. The branch worked closely with Economic Development and Trade in evaluating natural gas supply and pricing options for a prospective ammonia plant.
- monitored the Public Utilities Review Commission (PURC) hearings on the Saskatchewan Power Corporation's (SPC) 1983 electricity and natural gas rate application, and reviewed the impacts of the Phase I and II PURC rulings on SPC and electricity and natural gas consumers.
- prepared a detailed energy demand forecast for Saskatchewan for submission to the National Energy Board's Update of Energy Supply and Demand in Canada, 1983-2005.

## Regulatory Reform

The Energy Policy Branch assisted in analysing and formulating marketing strategies for the department, and has made significant contributions to the creation of a new pricing policy for materials and services provided by the department.

Work was done to formulate a strategy aimed at a greater and more beneficial development of oil and gas resources on federal native reserves in the province.

As well, branch staff made significant contributions to the process of reforming provincial regulations and legislation that govern the resources sector. A range of issues related to the disposition of Crown lands was identified and targetted for reform. These include: the use of expenditure requirements as a fiscal incentive/disincentive of oil and gas and other resources; the use of lease continuance regulations and policies in the oil and gas sector to maintain effective productivity from Crown lands; and the identification of policy and/or administrative shortcomings in the Mineral Resources Act, particularly in light of the recent amendment to the Canadian constitution. As the reform process proceeds, branch staff will continue to take an active role in the analysis of the impact any specific proposed reforms will have on the resources sector.

# Energy Technology Branch

The Energy Technology Branch was established to co-ordinate and promote the development of innovative energy technologies required in Saskatchewan. As consumers of energy, we can benefit from finding new ways to use conventional forms of energy more efficiently and from finding alternative forms of energy that may play a role in meeting our future needs. But also in Saskatchewan, as producers and exporters of energy, we will benefit from finding better ways to recover and utilize our vast energy resources like heavy oil and lignite coal. The fuller use of these resources would help meet the energy demands of ourselves and other Canadians while bringing economic benefits to the province.

To accomplish its purpose, the branch:

- puts in place and delivers funding programs to support energy research, development and demonstration (r,d&d) projects;
- co-ordinates energy r,d&d activities, in Saskatchewan wherever there is provincial government involvement;
- monitors energy r,d&d activities in Saskatchewan, Canada and internationally;

- liaises with other governments: provincial, federal, and foreign, to exchange project information and ideas, and to explore possible co-operative research efforts.

The Energy Technology Branch is also responsible for any alternative energy and energy conservation issues referred to the department.

In carrying out these responsibilities, the branch administers the following programs and activities:

## The Heavy Oil/Fossil Fuels Research, Development and Demonstration Program

This program is intended to encourage research, development, and demonstration of new technologies that facilitate the expanded production and use of Saskatchewan's fossil fuel resources. The program places particular emphasis on heavy oil, with lesser, but still significant emphasis on the enhanced recovery of light and medium oils, and on lignite coal.

Saskatchewan's large reserves of heavy oil and lignite coal have the potential to contribute significantly to Canada's energy supply and to Saskatchewan's economic development. However, technical barriers hinder the expanded production and fuller utilization of these resources.

The high density and high viscosity of heavy oil combined with the thin, unconsolidated sandstone reservoirs in which it is found make it difficult to produce. Only 5 percent of the heavy oil-in-place can be produced by primary recovery techniques. As well, heavy oil is difficult to transport and needs to be upgraded to increase its utilization.

Lignite is a low quality coal. Its high moisture and high ash content and hence low energy content limit its utilization and its economic transportation range.

The governments of Saskatchewan and Canada established the Heavy Oil/Fossil Fuels R,D&D Program to help remove the technical barriers to the expanded production and use of these resources. The Heavy Oil/Fossil Fuels Program is being implemented under two federal-provincial agreements:

- The Canada-Saskatchewan Heavy Oil Agreement, signed in 1976, and
- The Canada-Saskatchewan Heavy Oil/Fossil Fuels Agreement, signed in 1983.

As of March 31, 1984, these two agreements will make available a total of $32.3 million until March 31, 1988 for the funding of projects approved under the terms of the program.

In 1983-84 the Heavy Oil/Fossil Fuels R,D&D Program provided $3.2 million in funding to sixteen projects including:

- **Thermal Studies of Saskatchewan Heavy Oil Core Samples**
  The project involves the "thermal fingerprinting" of crude oil samples and the thermal analysis of core samples from selected heavy oil reservoirs. The data provided by the project will assist in understanding the mechanisms of fireflood in Saskatchewan reservoirs. The project will also begin to establish a data base that can be used to assess the applicability of various enhanced oil recovery and upgrading processes to various Saskatchewan reservoirs.
- **Characterization of Saskatchewan Crude Oil**
  During this project, tests will be performed to determine the physical and chemical characteristics of crude oils from selected Saskatchewan pools. As this information is gathered, it will be added to a data base that will be useful in determining the most effective recovery, processing and conversion technologies for any particular reservoir.
- **Characterization and Resolution of Saskatchewan Heavy Oil Emulsions**
  This project involves the characterization of emulsions produced by thermal recovery methods. The project also will investigate methods of breaking such emulsions. The electrical properties of the emulsions will be measured and related to stability, oil properties, and water content.
- **Determination of Acid Numbers and Desalting of Heavy Oil Feedstocks**
  The project includes characterization of thermally-recovered oils; quantitative identification of acidic components; laboratory bomb experiments to monitor acidic component formation under simulated thermal recovery conditions; and evaluaton of desalting parameters.
- **Evaluation of Transportation Options for Heavy Oil in Saskatchewan**
  The current method of transporting heavy oil is dependent upon the availability of condensate which is used as a diluent to lower the viscosity of the heavy oil so that it may be pipelined. This project has studied various transportation options for heavy oil and will be investigating the pipelining of several different crude-diluent mixtures as well as some oil-in-water emulsions.

## Canada-Saskatchewan Renewables/ Conservation Demonstration Program

The program was carried out as part of a national effort, over the period from March 1980 to March 1984 — a time when rapidly increasing energy prices and the security of oil supplies were of immediate concern to many Canadians. The time was right to evaluate and demonstrate renewable energy alternatives and new energy conservation practices.

The program provided a total of $3.85 million in funding to 31 projects to demonstrate the technical and economic feasibility of utilizing various renewable energy and energy conservation technologies in certain applications in Saskatchewan. It successfully demonstrated the most promising alternatives which were usually methods of using energy more efficiently. It also clearly demonstrated that certain technologies — solar, wind and geothermal — held little immediate promise in Saskatchewan.

An independent evaluation of the Renewables/Conservation Demonstration Program was completed in 1983-84. This evaluation concluded that the program had made good progress in learning about the performance and feasibility of new and innovative technologies under Saskatchewan conditions.

Several projects funded by the program are highlighted below:

- **The Retrofitting of Existing Recreational Facilities Project**
  During this project, four typical recreation facilities were retrofitted. It is estimated that the retrofits will save over $100,000 a year in energy costs. These energy savings will pay for the costs of the retrofits in less than four years.
- **Efficient Operation of Farm Tractors**
  This project demonstrated that fuel savings of 10 to 20 percent can be achieved by shifting to a higher gear and lowering the engine speed when operating a tractor under a light load. This reduction in fuel consumption represents an annual average potential saving of about $440 per farm or $26.6 million per year for all farms in Saskatchewan.
- **Rendering Vapour Waste Heat Recovery Project**
  A heat exchanger was installed at the Canada Packers slaughterhouse in Moose Jaw. The waste heat recovered by this exchanger was used to preheat water. The heat exchanger produced energy savings of $53,000 a year. These energy savings will pay for the cost of the heat exchanger in less than 2.7 years.
- **Waste Heat Greenhouse**
  A commercial sized greenhouse complex was constructed to utilize a low-temperature waste heat source. The project demonstrated that a larger greenhouse complex using a similar waste heat system would produce a reasonable return on investment.
- **Saskatoon Low Energy Homes**
  Fourteen attractive, affordable, low energy homes were built in Saskatoon to demonstrate the feasibility of low energy construction techniques. The energy costs of the homes are one-half to two-thirds those of a conventional home.
- **Heat Recovery Project**
  Prairie Malt Ltd. installed super-efficient indirect heaters and air-to-air heat exchangers in its malt drying plant in Biggar. The project resulted in an annual energy saving of over $200,000. This energy saving will pay for the cost of the equipment in less than five years.
- **Farm Energy Management Program**
  Energy use and energy costs were studied on 21 selected Saskatchewan farms to develop a farm energy management strategy for each farm. It is estimated that implementation of various energy conservation measures can save 10 to 30 percent of the energy cost on most farms or $40 million to $120 million per year for all farms in Saskatchewan.

Other projects include:

- The Audio-Visual Series on Energy Efficient Housing
- Construction of an Energy Efficient Recreational Complex in Tisdale
- University of Regina Geothermal Well Utilization Study
- Solar Heated Garage/Workshop
- Trombe Wall-Type Solar Collector on a Livestock Building
- Wind/Electric Conversion System Using a Small Wind Turbine
- The Production and Utilization of Fuel Peat in Buffalo Narrows
- Agricultural Energy Audit Vehicle
- Central Heating System for a Farm Using Flax Straw
- Demonstration of Wood Gasification in Hudson Bay
- Utilization of Waste Wood for Limestone Calcination
- Demonstration of a Grid-Connected Small Wind Turbine on a Saskatchewan Farm
- Wood and Solar Heated School in Northern Saskatchewan
- Conservahome — Energy Efficient Retrofit of Six Saskatchewan Homes
- Stack Gas Recycling in the Alfalfa Dehydration Industry
- Development of Energy Efficient Farm Implements
- Utilization of Wind Turbines for Pumping Oil
- Passive Solar Greenhouses for Small Gardens
- Waste Paper Incinerator Boiler
- Earth Sheltered Residence

Further information is available from the Energy Technology Branch regarding these and other projects funded under the Heavy Oil/Fossil Fuels, R,D&D Program or the Renewables/Conservation Program.

**Figure 1**
**Saskatchewan Energy Consumption by Sector**

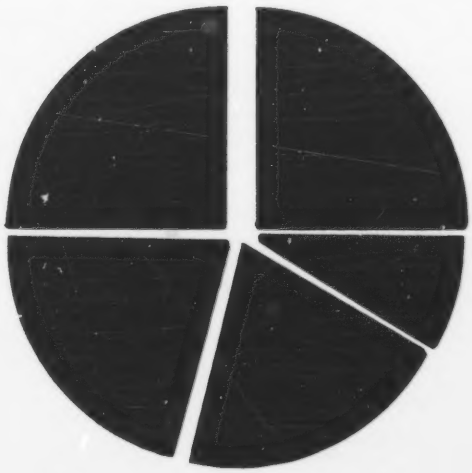
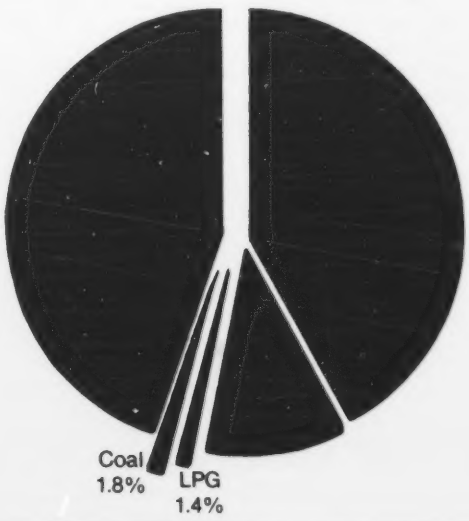


**Figure 2**
**Saskatchewan Energy Consumption by Fuel**



# Geology and Mines Division

**Les Beck**
**Executive Director**

The division is responsible for all geoscientific studies by the department, collection and maintenance of exploration data submitted by the mineral and petroleum industries, and disposition of all Crown minerals other than petroleum, natural gas, helium and oil shales. The division also undertakes mineral policy development, design and management of the mineral taxation systems and compilation of mineral production statistics.

The division is organized into two major branches, the Geological Survey Branch and the Mines Branch, and a Mineral Policy and Statistics Section.

## Geological Survey Branch

The role of the Geological Survey is geoscientific, regulatory and custodial; and is carried out against the background of the metallic, industrial mineral and petroleum exploration activity in the province. All of these industries, in one or other of their aspects, were on the rise during the year. This is reflected in the work of the Geological Survey by the rising indices of services rendered.

By nature of the geology of the province, the geoscientific program is divided between the northern and southern regions of Saskatchewan. That north of a line linking La Loche, La Ronge and Creighton is characterized by Precambrian igneous, metamorphic and sedimentary rocks that are host to the metallic mineral deposits, such as uranium, gold, copper and zinc. The Geological Survey through the Precambrian Mapping and Economic Geology Sections conducts inventory and studies of these rocks and mineral deposits in order to provide the regional framework against which mining company decisions can be made for exploration and development.

The region to the south is made up of the Phanerozoic sedimentary rocks which contain the petroleum, natural gas, potash, coal, sodium sulphate and clay resources of the province. These strata are mapped and studied by the Sedimentary Research Geology and Industrial Minerals Sections for similar reasons as those in the north.

Regulatory duties of the Geological Survey are performed under the requirements for the submission of bore hole cores, samples, geophysical logs and map data by the industry in the south; and in the north by monitoring of exploration programs. These duties are carried out by the Geodata Section and the Subsurface Geological Laboratory on the one hand, and on the other by the resident geologists at La Ronge and Creighton. Custodial services are also rendered by requirement of the regulations, as well as, by the needs of the geoscientific programs. These include the maintenance of data libraries arising from drilling activities, geophysical exploration and mineral work assessment on permits and claims under the Oil and Gas Conservation Regulations, the Oil and Gas Disposition Regulations and the Mineral Disposition Regulations, respectively.

The Geological Survey also provides a forum for dialogue with the industries on the mineral resources of the province by sponsoring symposia through the Saskatchewan Geological Society, by presenting an Annual Open House, by formal liaison meetings with counterparts in the other provinces and federal government, through the Committee of Provincial Geologists and the National Geological Surveys Committee, and through individual consultation. Open House 1983 was attended by 200 people, mostly from the metallic mineral industry. Individual consultations by the staff on nonregulatory resource matters exceeded 230.

### Precambrian Mapping Section

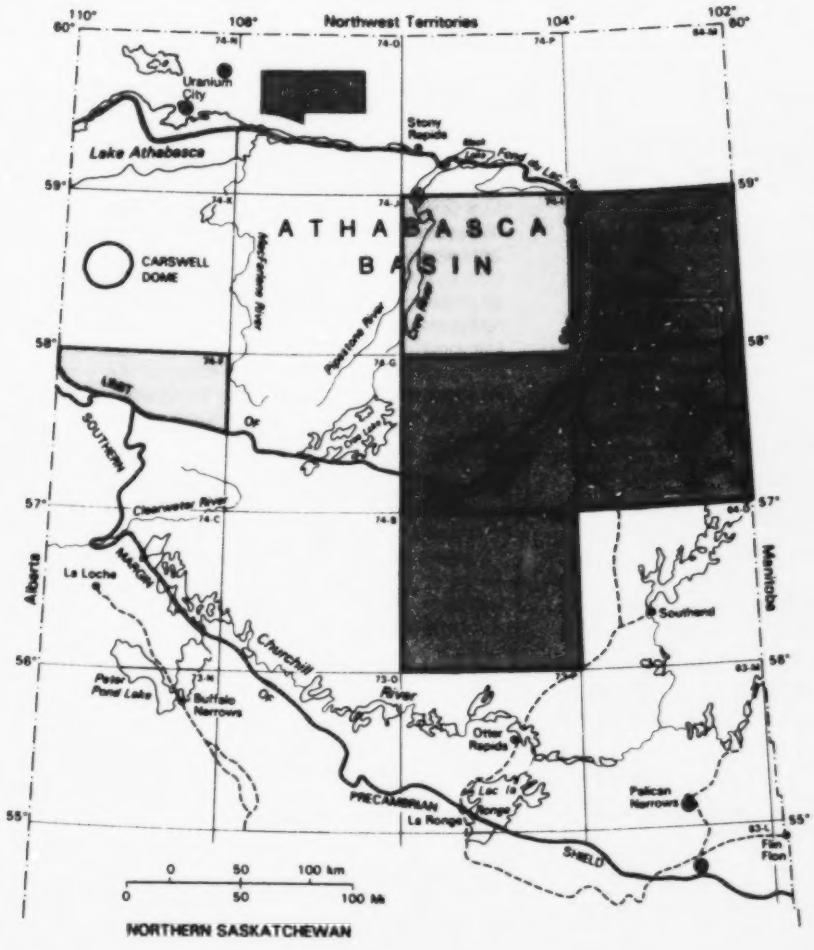
Field parties mapped about 4,000 square kilometres of the Precambrian Shield north of Fond-du-Lac under the 1983-84 geological reconnaissance program; and four coloured regional geological maps at the scale of 1:250,000 were published under the Compilation Geology project.

Review and compilation of the geology of the Beaverlodge area around Uranium City ("Project Beaverlodge") was also continued from the previous year. This program included a field investigation of the Prince Lake vicinity, and initiation of a study of the Martin Formation by contract with the University of Saskatchewan.

Other geoscience contracts were implemented with the Universities of Saskatchewan and Regina, and with Carleton University. In addition an informal liaison was entered into with the University of Kansas for radiometric age determinations of rocks in the Precambrian Shield of Saskatchewan.

The project dealing with the geology of the igneous — metamorphic rocks underlying the Athabasca Sandstone was concluded with the completion of reports and maps for the Open File. Data produced by this study are of value particularly in connection with the distribution of uranium deposits.

**Figure 3**
**Precambrian Mapping Section Projects**




1:250,000 Scale Bedrock Compilation Geology

Reconnaissance Bedrock Geological Mapping

1:250,000 Scale Sub-Athabasca Geology

Other Geoscience Projects

## Economic Geology Section

Uranium and gold deposit geochemical and geological studies were carried out in the vicinity of known occurrences near Uranium City around Nicholson Bay and Goldfields, where both metals have been mined in the past.

Investigations of gold deposits were continued in the Flin Flon - Amisk Lake area, where several past producers, one mine nearing production and numerous excellent mineral prospects are located. The geology and geochemistry of several prospects were studied and the information obtained integrated with data acquired in previous years from other deposits, to provide an overall model of gold deposit formation in the area.

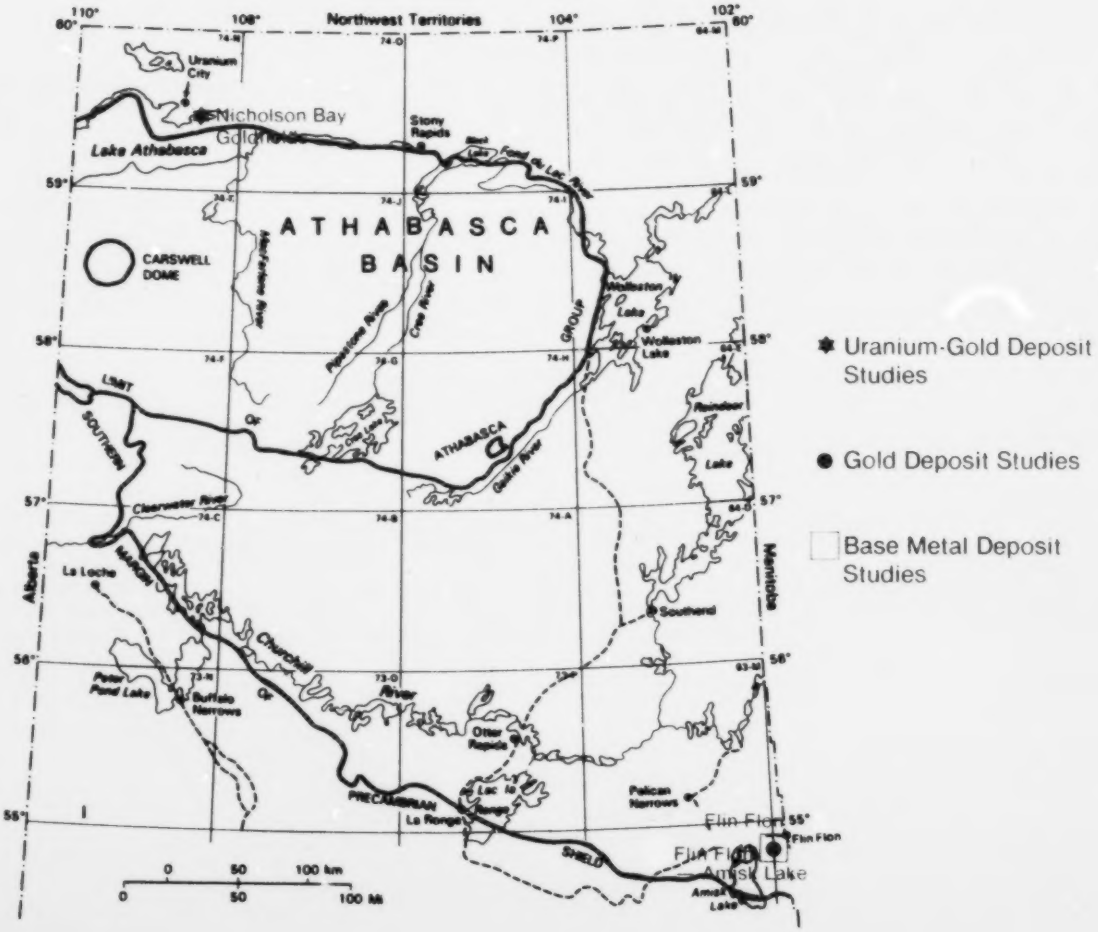
The core collection program undertaken through the office of the resident geologist in La Ronge was also continued. The collection, housed principally in La Ronge, comprises diamond drill core from many of Saskatchewan's metallic mineral deposits, as well as other geologically important sites.

Work on a new series of 1:250,000 scale mineral deposit maps was initiated. These maps will augment a similar scale compilation bedrock geology series currently in production, and will document the location, metal association, development status and type of mineralization of individual deposits and list all sources of data.

The resident geologists, through offices in La Ronge and Creighton monitor the mineral exploration industry in northern Saskatchewan and also service it by providing up-to-date information on exploration and mining activities and opportunities. The offices maintain files of current mineral claim maps, air photos, geological maps and reports and assessment work submissions for their respective districts. The Uranium City office was closed on September 15th, 1983 in response to a much reduced level of exploration in the Athabasca Mining District.

At the end of the fiscal year, the Economic Geology was reformatted to a newly named Mineral Development Section.

**Figure 4**
**Economic Geology Section Projects**



## Sedimentary Research Geology

The section is responsible for geological studies of the sedimentary rock formations in Saskatchewan, with special reference to the petroleum and natural gas fields, petroliferous trends, and areas with potential for new discoveries. By so doing, it is able to provide expert advice on these formations needed by the prospecting industry and departmental staff involved with land evaluation, oil reserve estimation and data management.

Resignations to the petroleum industry reduced staff by 60 percent and the number of projects to the one on the Tangleflags heavy oil field in the Lloydminster regions, and the other on the biogeochemistry of uranium in northern Saskatchewan. These projects were supplemented by partial support of MSc theses on the heavy oil bearing strata of the central Lloydminster producing region and the Cretaceous natural gas bearing sandstones of southwestern Saskatchewan, at the Universities of Regina and Windsor respectively.

At the end of the fiscal year the section was reformatted to the Petroleum Geology Section.

## Industrial Minerals Section

Work on the peat resource inventory and on the Buffalo Narrows fuel peat demonstration project was brought to a premature termination by budgetary constraints. The fuel peat demonstration project carried out near the community of Buffalo Narrows indicated that the production and utilization of fuel peat for domestic heating are technically feasible. The resource study revealed that much of Saskatchewan peatlands contain peat of fuel grade. The final report of the fuel peat demonstration project was released as Open File report 84-22. That on the peat resources in the western Saskatchewan peatland belt is in preparation.

Seven technical papers were presented during the fiscal year including one each for the Canadian Institute of Mining and Metallurgy, the sixth International Industrial Minerals Conference, the First International Potash Technical Conference and the seventh International Peat Congress.

The section responded to over 125 inquiries mostly from industry, related to a wide variety of industrial minerals. Peat resources ranked first in terms of interest and accounted for 20 percent of the inquiries followed by lignite, potash and clay.

## Geodata Section

### Sedimentary Geology Unit

During the fiscal year 663 new well records were added to the Computerized Well Data System, and over 5,160 well records were amended, corrected and updated by coding supplementary and corrected information.

A total of 2,186 new well files were established. Geological formation tops of 862 wells were picked and 750 new wells were coded for entry into the computerized system.

Well data supplied to industry and the department staff were as follows: Clerical staff pulled and refiled the records of 23,526 wells; 4,654 for department staff and 18,872 for industry. The staff also provided 47,509 pages of photocopied data to industry. Additionally, 8,217 submissions of technical data were received.

### Geophysics Unit

During the year 56 licenses were issued as well as Crew Certificates for geophysical exploration work, mostly seismic in southern Saskatchewan.

Technical studies underway were:

- a six-part interpretive geophysical map of the sedimentary basin of Saskatchewan. The map for the Kindersley area was completed.
- updating of the seismic structure contour map of southeastern Saskatchewan from newly declassified data.
- geophysical data index maps covering the southern half of the province. The maps are in two sets of six maps each.

### Precambrian Geology Unit

The unit is responsible for the maintenance and update of the following computerized files:

- mineral deposits index file
- Precambrian original data file
- Precambrian resource file
- Precambrian sample index file
- Precambrian geochemical file

File management is handled by a stand alone mini computer system and the main frame of SaskCOMP. Systems were developed to:

- catalogue Precambrian rock samples and to facilitate the work of sample storage and retrieval;
- enable search of the Saskatchewan mineral records by mineral suites, NTS area or any combination thereof;
- plot from the data files on the basis of latitude-longitude or universal transverse mercator co-ordinates.

Work on the Saskatchewan Mineral Deposit Index included verification and correction of computer-plotted index maps and the addition of 44 newly documented mineral showings to the data file. Updated documents of 555 new mineral showings were supplied to district offices and the National Mineral Inventory. Some 36 requests for the index were handled.

A total of 252 assessment files submitted under the Mineral Disposition Regulations were processed, 108 visitors were received, and 31 requests for information by mail and 84 by telephone were handled. Industry requests resulted in 3,479 copies of maps, 14,583 pages and other compilations of information being sent out. During the year, 780 assessment submissions occupying 25m of shelf space were catalogued and readied for processing.

**Subsurface Geological Laboratory Unit**

During the year 1983-84, the laboratory recorded the following activities:

New core received: 8,404 boxes from 522 wells

Core now in storage: 230,898 boxes

Drill cutting samples washed, catalogued and stored: 17,110 vials

Drill cutting samples, washed and catalogued for shipment to the Department of Energy, Mines and Resources, Calgary: 13,443 vials. Actual samples shipped: 11,379

Number of industry users for the laboratory: 164 from 97 firms

Cores examined: 49,436 boxes from 3,186 wells

Samples examined: 361 wells

Temporary transfers of cores to outside the province: 36 wells

Thin sections prepared for staff: 1,194

The general public, in particular elementary school teachers and their earth science classes, continued to show interest in laboratory building tours. Several such tours, finishing with a brief talk and question period, were conducted during the year. The core examination facilities were also utilized by university students in conjunction with geological course work and theses.

## Publications


Lewry, J. F., 1983
Geology of an Area Around Kohn Lake. Saskatchewan Geological Survey Report 222.

Macdonald, R. and Thomas M. W., 1983
Compilation Bedrock Geology, Reindeer Lake North NTS Area 64E (1:250,000 scale map with marginal notes). Saskatchewan Geological Survey Report 232.

Ray, G. E., 1983
Compilation Bedrock Geology, Foster Lake, NTS Area 74A (1:250,00 scale map with marginal notes). Saskatchewan Geological Survey Report 228.

Ray, G. E., 1983
Compilation Bedrock Geology, Geikie River NTS Area 74H (1:250,000 scale map with marginal notes). Saskatchewan Geological Survey Report 229.

Sibbald, T. I. I., 1983
Geology of the crystalline basement, NEA/IAEA Athabasca Test Area; in Uranium Exploration in Athabasca Basin, Saskatchewan, Canada, ed. E. M. Cameron; Geological Survey of Canada, Paper 82-11, p 1-14.

Stolz, H., 1983
Induced polarization and resistivity survey at the Midwest uranium deposit; in Uranium Exploration in Athabasca Basin, Saskatchewan, Canada, ed. E. M. Cameron; Geological Survey of Canada, Paper 82-11, p 291-296.

Stolz, H., 1983
Downhole temperature observations about the Midwest uranium deposit; in Uranium Exploration in Athabasca Basin, Saskatchewan, Canada, ed. E. M. Cameron; Geological Survey of Canada, Paper 92-11, p 297-302.

Suryam, J. V., 1983
Seismic Investigations on the Perimeter of the Athabasca Basin (Wollaston Lake - Black Lake) 64L (part) and 64P (part). Saskatchewan Geological Survey Rept. 216.B

Thomas, M. W., 1983
Compilation Bedrock Geology, Wollaston Lake, NTS area 64L (1:250,000 scale map with marginal notes). Saskatchewan Geological Survey Report 211.


## Open File Reports


Johnston, W. G. Q., 1983
Geology of the Southend Area. Saskatchewan Geological Survey Open File Report 82.4

Johnston, W. G. Q., 1983
Geology of the Royal Lake and Laird Lake (East) Areas. Saskatchewan Geological Survey Open File Report 83-1.

MacDougall, F. H. , Watters, B. R., and Parslow, G. R., 1982
Mineral occurrences in the Precambrian NTS areas 63K and 63L. Saskatchewan Geological Survey Open File Report 82-6.

Parslow, G. R., and Stolz, H., 1983
Evaluation of techniques for assessing the uranium potential of lake-covered areas. Saskatchewan Geological Survey Open File Report 79-1.

Saskmont Engineering, 1984
Buffalo Narrows Fuel Peat Demonstration Project. Saskatchewan Geological Survey Open File Report 84-22.

Thomas, M. W., and Slimmon, W. L., 1983
Data Files 1-4 (Comprehensive Bibliographies for Reports 211, 228, 229 and 232). Saskatchewan Geological Survey (unpublished).

## Mines Branch

This branch is responsible for the disposition, development and conservation of all Crown minerals with the exception of petroleum, natural gas, helium and oil shale. The activities of the branch are carried out through the Mining Lands Section and the Development Section.

### Mining Lands Section

Mining Lands is responsible for the administration and disposal of Crown minerals under the following regulations:

- The Minerals Disposition Regulations, 1961 (uranium, base and precious metals);
- The Quarrying Regulations, 1957 (sand, gravel, clay, bentonite and other quarriable substances);
- Alkali Mining Regulations (sodium sulphate);
- The Coal Mining Regulations, 1957 (coal); and
- The Subsurface Mineral Regulations, 1960 (potash, salt).

Activities of the section are centered in Regina, but a field office is also maintained in La Ronge to permit local administration of regulations.

A total of 531,106 hectares of new disposition covering 345 mineral claims, 122 claim blocks and 4 prospecting permits were taken out under The Mineral Disposition Regulations, 1961, a decrease of about 35 percent from the area taken out in the previous year.

On March 31 there were 39,562 hectares held under 2,444 mineral claims; 3,289,240 hectares held under 1,110 mineral claim blocks; 2,394,734 hectares held under 35 mineral prospecting permits; and 420,596 hectares held under 651 leases. The total area held was 6,144,132 hectares, down 44 percent from March 31, 1983

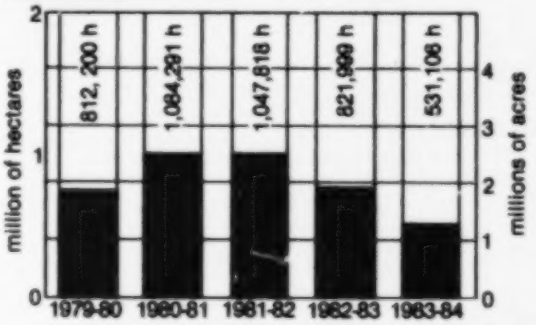
In the year under review, six prospecting permits covering 1,111 hectares and 61 leases covering 1,034 hectared were granted under the Quarrying Regulations, 1957. Five of the prospecting permits were for combined sand, gravel and rock and one for sand and gravel. Of the leases, 55 were granted for one or more of sand, gravel, rock and clay, of which seven were acquired by Saskatchewan Highways and transportation, 25 by rural and urban municipalities, and 23 by private interests. Six quarrying leases were granted for clay. At year end 2,438 hectares were held under seven prospecting permits and 20,259 hectares were held under 1,030 quarrying leases.

Three alkali mining leases covering 840 hectares were issued during the year, bringing the total alkali dispositions held at March 31 to 33 leases covering 9,777 hectares.

Four coal leases were issued and 190 were surrendered, resulting in a total of 120,579 hectares being held under disposition for coal on March 31, down 25 percent from the previous year.

One potash lease was reduced by 9,641 hectares, giving at March 31 a total of 203,926 hectares held under nine potash leases and one permit, an area reduction of 4.5 percent from the previous year.

**Figure 5**
**New Areas Acquired Under Claims, Claim Blocks and Permits**




### Development Section

The Development Section is responsible for administration of sections of The Mineral Disposition Regulations, 1961, governing the conduct and reporting of mineral exploration work programs and for monitoring mining activity.

#### Exploration Unit

The unit is responsible for evaluating technical data submitted as assessment work by the mineral industry under the Mineral Disposition Regulations, 1961.

Assessment work received during a fiscal year gives an indication of major trends in the level of mineral exploration activity and the geographic areas in which such activity has taken place, although it does not provide a true measure of total exploration expenditures. A total of 1,378 submissions covering nine categories of exploration work were received, down about 27 percent from the previous year. Exploration expenditures claimed were down 53 percent from 1982-83 ($22.6 million vs. $48.2 million; vs. $54 million in 1981-82). Approximately 50 percent of the total reported expenditure was for diamond drilling, and approximately 58 percent was associated with the search for uranium in the Athabasca Basin.

#### Engineering Unit

The major functions of the unit are to:

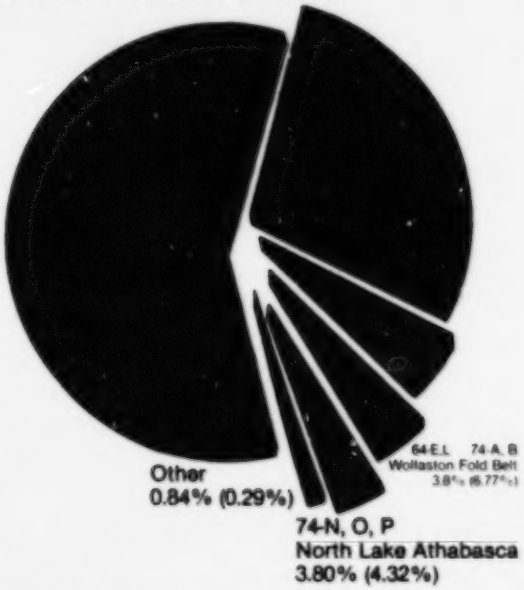
- monitor development and mining operations pertaining to those minerals for which the branch has responsibility; and
- review project proposals and technical reports pertaining to mining developments referred to the department by Saskatchewan Environment as part of the environmental impact assessment process.

Initial drafts of reports covering the operations at ten potash mines, three coal mines and one base metal mine were completed during the year.

Mining advance plans updated to the end of calendar year 1983 were received for four potash mines and five coal mines.

During the year, two technical reports pertaining to mine development were reviewed, one of which was directly associated with an environmental assessment required by Saskatchewan Environment.

**Figure 6**
**1983-84 Exploration Expenditure Distribution by Area**
(1982-83 Comparative Distribution)




## Mineral Policy and Statistics

The Mineral Policy and Statistics Section is responsible for the analysis of mineral issues and economic and revenue forecasting related to metallic minerals (uranium, base metals, precious metals, and other "hard rock" minerals) and industrial minerals (potash, sodium sulphate, aggregates and other quarriable commodities). The section conducts research and policy formulation to ensure the maintenance of a healthy investment climate in the province's mineral resource sector.

Specifically, the Mineral Policy and Statistics Section:

- monitors and evaluates issues to all aspects of the development, production, taxation and marketing of mineral resources;
- monitors and evaluates the impact of royalties and taxation on the industry and recommends policy changes when necessary;
- monitors the impact of federal policies on the provincial resource sector;
- maintains ongoing consultation with industry officials to ensure the maintenance of a healthy investment climate;
- recommends special incentives measures as necessary and aids in their implementation;
- prepares economic and Crown revenue forecasts;
- prepares briefing materials and position papers to inform senior management of upcoming issues and changes in the mineral resource sector; and
- collects and analyzes statistical data on the mineral sector for research purposes and inclusion in the deparment's Mineral Statistics Yearbook.

### Potash

Discussions with industry representatives continued throughout the fiscal year to develop a replacement tax structure for the Potash Resource Payment Agreements which expire June 30, 1984. This consultative process included a number of industry/department meetings and the exchange of respective position papers.

Staff members closely monitored the turnaround in the potash market where a significant improvement in sales was experienced in both the domestic and offshore market. However, the overall profitability of the industry remained below average because of only moderate recovery in potash prices.

Ongoing policy analysis continued on a number of issues related to taxation and the development of the province's potash industry. Assistance was given to industry officials, departmental staff and other government agencies in the interpretation of the agreements and regulations.

### Uranium

Throughout the fiscal year staff members monitored the performance of the industry and of world uranium markets. Spot market prices declined from temporary highs during the summer to a new low at the end of the fiscal period. The average Saskatchewan price continued to decline, but less rapidly than in the past two years. Sales volumes declined sharply but the reduction is expected to be temporary. Production volume picked up during the year as Key Lake came onstream, although it had not reached design capacity by the end of the period. As the production level builds, sales should quickly surpass previous record levels.

Section staff also closely monitored uranium royalty levels and were involved in assessing the performance of the uranium royalty regime. They continued to monitor the pricing trends in long term contracts.

Section staff assumed responsibility for the uranium public relations function which was previously handled by Executive Council.

**Metallic Minerals**

Section staff participated in a joint industry/ government working group to discuss the changes in the Mineral Disposition Regulations, 1961. A joint position paper was prepared by the working group and submitted to the department for consideration.

Section staff, in consultation with industry officials, developed a mineral industry recovery package to be introduced in conjunction wih the spring budget. This package was aimed at stimulating development activity in the base and precious metal sector and was generally well received by industry. Department officials are confident that these measures will result in increased activity in the hard rock sector and still act as a stimulus for production decisions of a number of gold properties that are in the advanced exploration stage.

**Other Industrial Minerals**

The section also addressed policy issues related to the development and management of other industrial minerals in the province. The major mineral was sodium sulphate, with that industry experiencing another successful year.

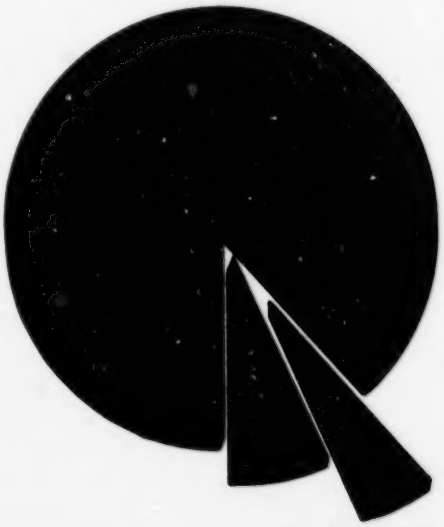
## Information and Education

Requests for information on a variety of topics related to the mineral resource industry in Saskatchewan are handled on a routine basis. These requests come from industry and government officials, teachers, students, and the general public. Articles on various aspects of the mineral industry in Saskatchewan are also prepared for presentation and publication in various trade publications and for presentation at conferences.

A short course was prepared and taught to classes in Buffalo Narrows, La Ronge, and Cumberland House as part of the mill workers training program.

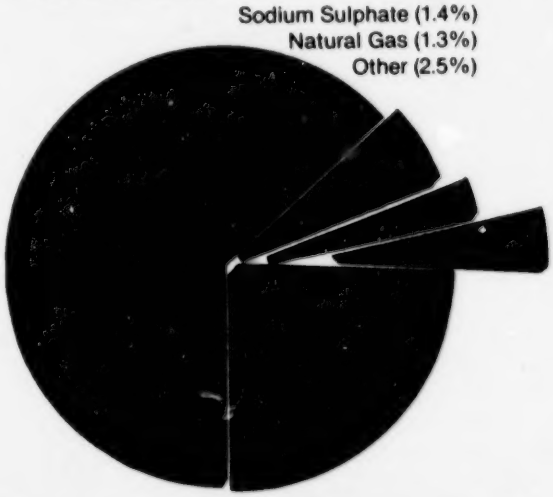
About mid-year responsibility for the educational duties and routine informational requests was transferred back to the Geological Survey so that the incumbent could devote more time to mineral policy matters.

**Figure 7**
**Crown Reserves Derived From Minerals — 1983-84 Fiscal Year**



Uranium (1.2%)
Natural Gas (.6%)
Sodium Sulphate, Coal, Other (2.12%)

**Figure 8**
**Value of Saskatchewan Mineral Sales — 1983 Calendar Year**



# Petroleum and Natural Gas Division

**Bruce Wilson**
**Executive Director**

The Petroleum and Natural Gas Division has major responsibilities in all areas related to provincial jurisdiction over oil and gas resources including: disposition and management of Crown oil and gas rights; well licensing and surveillance of all exploration, development and production operations; oil and gas conservation including determination of reserves and producibility estimates, maintenance of production and disposition statistics, crude oil marketing, and royalty and tax legislation.

The division is organized into five branches:

- Geology and Petroleum Lands
- Engineering Services
- Economic and Fiscal Analysis
- Petroleum Development
- Petroleum Statistics

The past year was a record breaking year in many respects for the oil and gas industry in Saskatchewan. New records were established for the number of drilling licenses issued, the number of wells drilled and the amount of revenue collected from the disposition of Crown oil and gas rights. Crude oil production was also up significantly. The increased activity was in response to the province's oil recovery program initiatives of 1982, improved market conditions for oil, and the natural gas policy changes announced in early 1983.

## Drilling Activity

Record oil and gas industry drilling activity took place in 1983. A total of 1,843 wells were drilled exceeding the previous record of 1980, by 345 wells. The increased drilling is a direct result of the oil and gas industry's response to the government's recovery program. Land sale interest was extremely high, indicating that 1984 drilling will continue at a rapid pace. A breakdown of 1983 drilling activity follows: 1,441 completed oil wells, 159 completed gas wells and 243 abandoned dry holes for a success ratio of 87 percent. There were 1,921 licenses issued in comparison to 912 in 1982.

**Figure 9**
**Total Metres Drilled By Area**

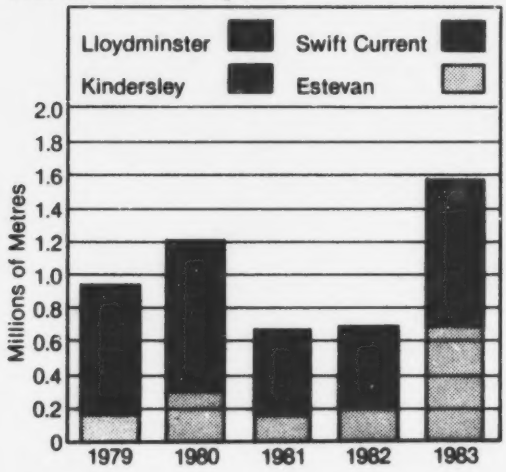
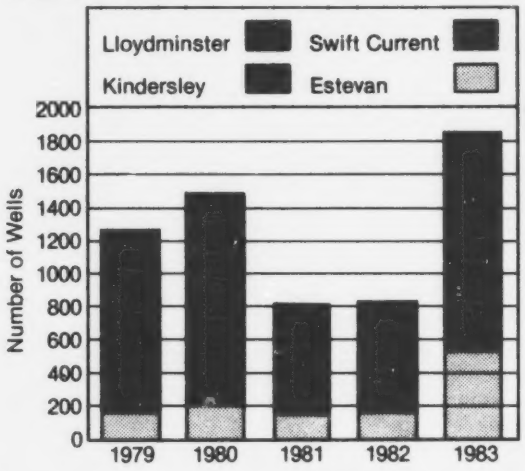



**Figure 10**
**Wells Drilled By Area**




## Crude Oil Production

Oil production in 1983 was 9.54 million cubic metres compared to 8.10 million cubic metres in the previous year. This 17.8 percent increase was the result of improved markets for Saskatchewan's crude oil and increased drilling activity. An average of approximately 2 percent of the province's production was shut-in during 1983 due to marketing difficulties. The anticipated strong market conditions and high rate of oil well drilling in 1984 are expected to increase production over the 1983 level.

Saskatchewan's oil production is made up of different qualities of crude commonly identified as light, medium and heavy found in different geographical areas. In 1983, approximately 33.7 percent was heavy oil, 34.9 percent was medium and 31.4 percent was light.

**Figure 11**
**Crude Oil Production**

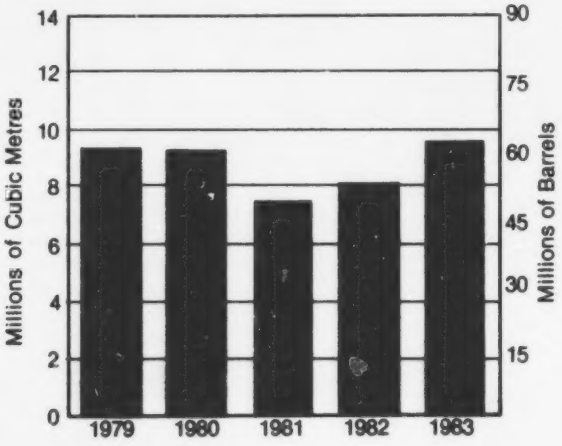
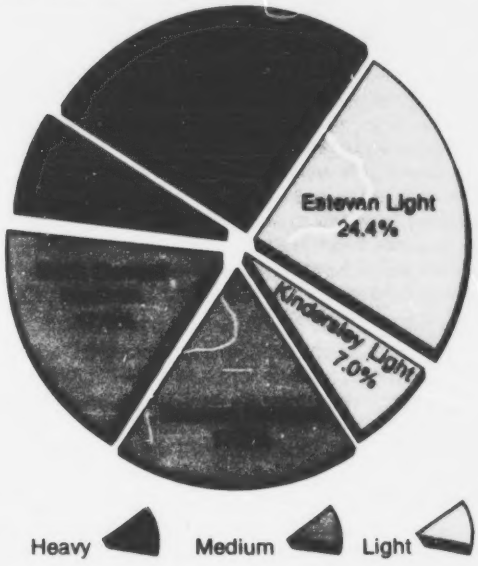


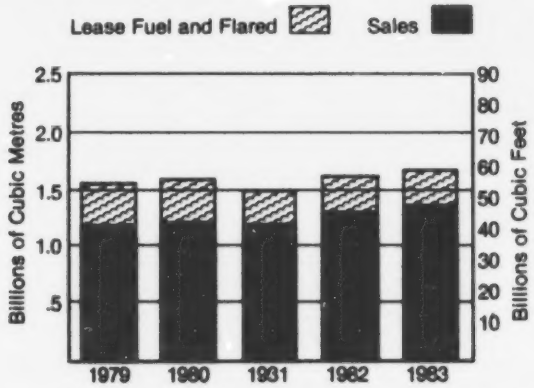
**Figure 12**
**Quality of Saskatchewan Crude Oil Production By Area** for Calendar Year 1983




## Natural Gas Production

Natural gas production in 1983 was 1.67 billion cubic metres, an increase of 3 percent from the previous year when it was 1.62 billion cubic metres. Sales of natural gas were 1.34 billion cubic metres with the remainder of the production used for lease fuel or flared. These sales represent about 40 percent of provincial demand with the difference imported from Alberta. Natural gas production will progressively increase in the next four years because these imports will be reduced. Import reduction will allow the province's shut-in reserves to be developed and produced.

**Figure 13**
**Natural Gas Production**



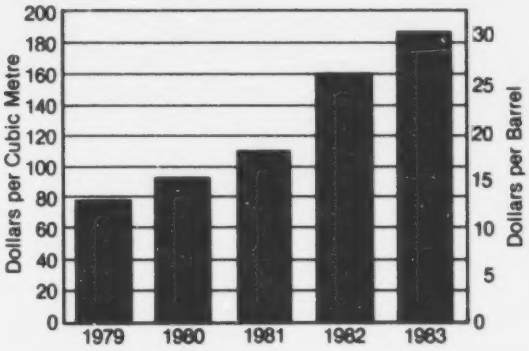

## Average Crude Oil Prices

The average 1983 Saskatchewan crude oil price of $186.19 per cubic metre represents a 17 percent increase above the $159.38 per cubic metre average for 1982. Although the world price of crude oil dropped by $31.46 per cubic metre (U.S.) during the first half of 1983, several factors contributed to an overall increase in average price:

- scheduled $25.17 per cubic metre increase on conventional old oil in January 1983.
- amendments to the Canada-Saskatchewan Energy Agreement which extended the equivalent world price to an additional 9,535 cubic metres per day of production in July, 1983.

Approximately 40 percent of Saskatchewan's production received the equivalent of world price during the 1983 calendar year.

**Figure 14**
**Average Crude Oil Prices**




# Geology and Petroleum Lands Branch

## Geology Mapping and Land Evaluation Section

This section has two principal responsibilities: geological mapping and land evaluation.

### Geological Mapping Unit

Geological maps (mainly structure contour maps) are drawn and maintained for all oil and gas producing areas in the province and are used for land evaluation, reserve calculations in the Engineering Services Branch, and in helping solve problems related to the producing areas. At the end of the fiscal year, 113 pool maps were being maintained. The maps may be purchased from the department's publications office.

In carrying out their mapping work geologists acquire a detailed knowledge of the geology of producing oil and gas pools. This expertise is put to use within the Petroleum and Natural Gas Division when staff members are asked to make

recommendations on submissions from industry or in dealing with other administrative matters.

Industry submissions in the reporting period included applications for pressure maintenance of producing units, conversion of wells to salt water injection and disposal, and secondary recovery of oil by waterflood. As well, requests were received for permission to drill wells outside the approved spacing pattern and for abnormal well spacing patterns.

Information and advice were made available to other branches, departments and the general public on requests ranging from the interpretation of the economic geology of known oil and gas accumulations to the hydrocarbon potential of unexplored prospects.

**Land Evaluation Unit**

The economic potential of hydrocarbon resources underlying specific areas of the province is determined as required by the department. Monetary evaluations of reserves are primarily for land sales. As well, this unit:

- reviews and recommends requests from industry for the posting of specific Crown mineral lands at department land sales;
- prepares sales notices and technical data for sales;
- reviews and recommends acceptance or rejection of bonus bids received from industry on posted lands;
- evaluates and selects Crown acreage in drilling reservations when such reservations go to lease;
- administers net royalty leases and inspects non-unit net royalty leases and farmouts to ensure compliance with the terms or agreements made within the department;
- reviews requests for waiver of offset well commitments on leases adjoining certain freehold lands producing oil or gas and makes follow-up recommendations;
- advises industry and the general public concerning the value of mineral rights for specific areas.

Four sales of Crown petroleum and natural gas rights were held during the 1983-84 fiscal year. Revenues totalled $123,964,219.86 This is a record high for the 30 years that the province has held such sales. This $48.9 million realized in the December 6, 1983 sale also set an all time record high for revenue from a single sale. Dispositions of mineral rights in the 1983-84 fiscal year totalled 278,847 hectares (689,046 acres), consisting of 16 permits containing 84,867 hectares (209,710 acres), 34 drilling reservations comprising 46,745 hectares (115,510 acres) and 1,129 leases consisting of 147,235 hectares (363,826 acres).

Revenue from the sale of petroleum and natural gas rights for the past five years is shown in Figure 15.

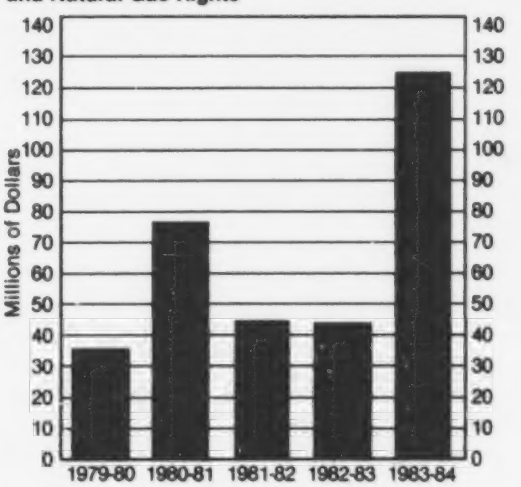
## Petroleum Lands Section

This section is responsible for the administration and disposition of Crown mineral lands under The Petroleum and Natural Gas Regulations, 1969; The Helium and Associated Gases Regulations, 1964; and The Oil and Shale Regulations, 1964.

The number of petroleum and natural gas permits under disposition increased from 45 at April 1983 to 46 at March 31, 1984 with a decrease in area from 290,746 hectares (718,450 acres) to 270,136 hectares (667,520 acres). Drilling reservations under disposition increased in the same period from 20 to 33 with an increase in area from 25,981 hectares (64,200 acres) to 44,291 hectares (109,445 acres). There were 7,119 petroleum and natural gas leases in effect. Area under lease totalled 2,291,680 hectares (5,662,864 acres).

Lands under helium dispositions decreased from 40,728 hectares (100,642 acres) to 15,467 hectares (38,221 acres) held under six helium leases. Also in effect at the end of the fiscal year was one oil shale leasing totalling 1,942 hectares (4,800 acres).

**Figure 15**
**Revenue from the Sales of Crown Petroleum and Natural Gas Rights**




# Engineering Services Branch

The Engineering Services Branch evaluates Saskatchewan's crude oil and natural gas reservoirs to ensure that exploration, development and production of these resources follow good conservation and engineering standards. Sound management of these resources is essential to achieve efficient production and ensure maximum benefits from development. The mandate for these responsibilities comes from The Oil and Gas Conservation Act, The Mineral Resources Act, The Pipe Lines Act and respective regulations.

Specifically, this branch:

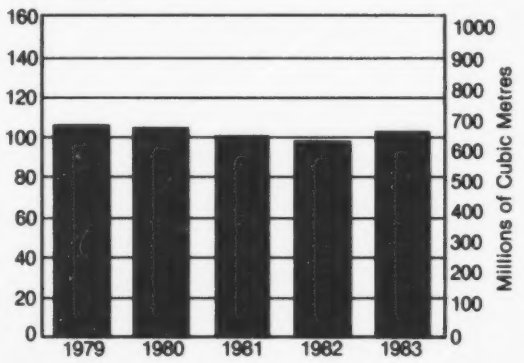
- determines crude oil and natural gas reserves for use by industry and government in planning and developing policies;
- evaluates industry applications for enhanced oil recovery projects, waste water disposal wells, off-target wells and other proposals and participates in public inquiries held to consider these applications;
- assesses unitization proposals to ensure that Crown lands receive fair and equitable unit participation;
- evaluates industry submissions for incremental oil production from waterflood and enhanced oil recovery projects to establish reductions to Crown royalties and freehold production taxes;
- establishes pool boundaries, well spacing and target areas to facilitate orderly oil and natural gas development;
- issues maximum permissive production rates for oil wells and daily allowables for gas wells, and monitors production to ensure that these rates are not exceeded;
- issues construction and operating permits for oil and natural gas pipelines and witnesses pressure tests conducted to ensure that pipelines meet operating standards;
- prepares for publication, pertinent engineering, development and production data for oil and natural gas pools, including monthly demand for Saskatchewan crude oil;
- provides technical expertise and assistance to the Management Committee of the Canada-Saskatchewan Heavy Oil Agreement and the Heavy Oil/Fossil Fuel Research, Development and Demonstration Program;
- monitors crude oil markets and tabulates nominations for crude oil;
- provides technical assistance to other branches and divisions in the department.

## Crude Oil Reserves

Saskatchewan's remaining established crude oil reserves were increased by 3.9 million cubic metres to 102.2 million cubic metres in 1983. This is the net result of an increase in initial reserves of 13.4 million cubic metres less production of 9.5 million cubic metres. This is the first time in the last five years where the annual reserve increases have exceeded production, largely attributed to the record exploratory and development drilling activity.

The department estimates that the potential enhanced oil recovery reserves are 667 million cubic metres with 86 percent of these reserves classified as heavy oil. These potential reserves are an indication of the oil that can be recovered assuming that enhanced oil recovery techniques are successfully applied. Considerable technical risk currently exists requiring further research and experimentation.

**Figure 16**
**Remaining Oil Reserves**

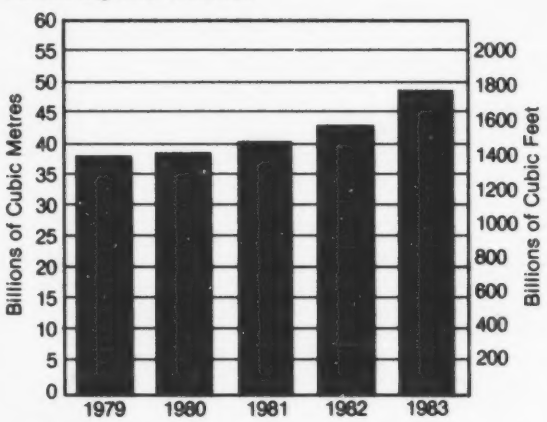



## Natural Gas Reserves

Saskatchewan's remaining established natural gas reserves were increased by 5.3 billion cubic metres to 48.5 billion cubic metres in 1983. This is the net result of an increase in initial reserves of 6.6 billion cubic metres less established reserves production of 1.3 billion cubic metres.

The department estimates that the remaining ultimate potential which includes established reserves ranges between 76 and 161 billion cubic metres. Additional exploration and development is required for better evaluation.

**Figure 17**
**Remaining Gas Reserves**




# Economic and Fiscal Analysis Branch

The Economic and Fiscal Analysis Branch evaluates, designs and implements oil royalty/tax systems, development/exploration incentive systems and prepares oil production and revenue,

and expenditure forecasts. The prime objective of the branch is to maintain an active and healthy oil industry plus maintain a fair and reasonable share of oil revenues for the Crown. Functionally, the branch is divided into the Fiscal Analysis and Incentive Administration sections.

## Fiscal Analysis Section

This section analyses and designs the crude oil royalty and tax structures and prepares production and revenue forecasts. Adjustments to the oil royalty and tax structures are made through amendments to The Petroleum and Natural Gas Regulations, 1969 The Freehold Oil and Gas Production Tax Regulations, 1983 (for non-Crown production after 1982).

More specifically, this section:

- evaluates economics of crude oil exploration, development and production under varying federal and provincial fiscal arrangements;
- analyses royalty and tax incentives to encourage exploration, development and production;
- designs royalty and tax structures and necessary regulations;
- monitors and forecasts Crown revenues;
- monitors revenue sharing between governments and industry;
- prepares submissions to boards and commissions on future crude oil supplies and demand.

During the 1983, a number of meetings with oil industry associations and individual companies resulted in considerable progress toward completion of the cost sensitive royalty/tax structures for enhanced oil recovery (EOR) production. The structure, which recognizes the high costs and risk associated with implementing EOR projects, means more complex administrative procedures for determining the royalty/tax payable. Most of the discussions with industry focussed on these procedures. The amount of EOR production in 1983 was approximately 4 percent of the provincial total or 2.4 million barrels.

The OPEC announcement of a $5(U.S.) per barrel drop in the price of crude oil in the spring of 1983 created an uncertain climate for industry. While the falling oil prices were good news to most Canadians, in the oil producing provinces, there was cause for concern. The federal and provincial governments were forced to review the taxation and pricing agreements of 1981. To increase or maintain the cash flow to industry, the New Oil Reference Price (NORP) or world price was granted to approximately 60,000 additional barrels of oil per day effective July, 1983 to December 1984 inclusive. This increased the percentage of oil in the province receiving the equivalent of world prices to approximately 60 percent. In addition, the province extended the expiry date of the one year royalty/tax holiday for new drilling to the end of 1985 (two years) and consolidated royalty curves to simplify and rationalize the system. These moves combined, helped maintain an active oil industry in Saskatchewan.

The method used to determine the NORP for the varying qualities of crude oil was subject to controversy in 1983. In a lengthy, co-operative review by the Canada, Alberta, and Saskatchewan governments, a new system was developed to track international prices more closely. The system was instituted in January 1984, resulting in a marginal revenue increase to the province.

A forecast of Saskatchewan's crude oil supply prepared as part of the department's submission to the National Energy Board on future energy supplies and demand. Total oil reserve additions from 1983 to 2005 are predicted at 1.2 billion barrels which is two times the current remaining established reserves. In future, activity is expected to be more concentrated in heavy oil areas where there is an estimated 25 billion barrels of oil-in-place.

## Incentive Administration Section

The Incentive Administration Section is responsible for the development, analysis and administration of incentive programs offered by the province to promote increased activity. The section closely monitors the cost effectiveness of these incentive programs to ensure maximum return for the province's incentive dollar as well as a positive atmosphere for development and exploration in the province.

The one year royalty/tax holiday for non-deep development drilling was introduced in July, 1982 and was expanded to include approved infill drilling in early 1983. Incentive Administration is responsible for assisting with the review of infill applications when there are waterflood and workover implications. It also reviews all requests for extensions to the one year royalty/tax holidays and assists with holiday determination for special cases where a company wishes to redrill a well. In 1983 approximately 1,200 wells were eligible for the one royalty/tax holiday.

A one year royalty/tax holiday is also available for incremental production from new or expanded waterfloods. The section helps decide incremental factors to be applied in determining production eligible for the one year holiday.

Three year royalty/tax holidays were introduced for non-deep exploratory drilling in early 1983. Evaluations are made at the time of licencing to determine which wells qualify for the three year royalty/tax holidays based on the depth and distance requirements set out in the regulations. In 1983, 150 wells were approved as exploratory, eligible for the three year royalty/tax holiday.

Three and five year royalty/tax holidays were introduced for deep drilling in July 1982. This section is responsible for ascertaining which wells qualify for the deep well royalty/tax holidays. Only seven wells were approved as deep wells in 1983 but there is optimism, that this number will increase in future.

Economic and technical evaluations are carried out on applications under the Workover Incentive Program. Under this program the department may approved the reclassification of old oil production to new oil for royalty/tax purposes. Approval requires submission of a work program to maintain and improve production from old oil wells and units.

A three year phase-out of the Approved Expenditure Grant Program was initiated January 1, 1983. Under the terms of the phase-out, companies can recover all or a portion of the approved expenditure credits that were built up under the old grant program. Responsibilities include forecasting and determining payment requirments, and handling industry inquiries. In the 1983/84 fiscal year $35 million was paid out under this program.

The Incentive Administration Section also:

- monitors and forecasts exploration and development expenditures;
- monitors and forecasts operating costs associated with the production of crude oil;
- assists the federal Petroleum Incentives Administration with technical information on petroleum applications;
- conducts economic analysis on special problem issues, wells and projects;
- conducts engineering evaluations related to oil and gas economics.

## Petroleum Development Branch

The Petroleum Development Branch is responsible for ensuring that the field operations of the province's oil and gas industry meet acceptable technical and environmental protection standards as established under The Oil and Gas Conservation Act. The division is supervised from Regina with field offices strategically located at Estevan, Swift Current, Kindersley and Lloydminster.

The Regina staff:

- directs field office operations;
- processes and approves applications for well drilling licenses and licenses to operate drilling and service rigs;
- maintains records and control of well deposits made to guarantee proper drilling, completion and abandonment of wells;
- processes and approves well ownership and name changes;
- advises of offset drilling commitments on Crown land;
- processes weekly drilling reports and compiles statistical data relating to drilling activity;
- represents the department on oil spill co-operatives.

The field office staff:

- collects and compiles drilling, completion and reservoir data;
- enforces regulations, orders and policies pertaining to pollution control in the oil industry;
- checks standards, procedures and equipment used by industry in drilling, producing and abandonment of wells;
- witnesses production tests;
- performs on-site inspections of all wells and facilities;
- investigates and assists in resolving landowner problems associated with the use of land for exploration and production;
- investigates, reports and ensures that industry act promptly and efficiently in handling oil and salt water spills.

During the past fiscal year, there were 700 well ownership changes and 191 well name changes. Assignment agreements were registered and recorded in the appropriate department records for each ownership change. Offset commitments were called on 276 wells. Field office staff carried out 25,000 well, battery and rig inspections, 900 pressure maintenance/water disposal checks, 52 landowner complaint investigations, 400 gas meter inspections, 677 spill investigations, and reported on all of the drilling and completion work.

In April of 1983 a 7,000 barrel oil spill occurred on the Wascana Pipeline immediately east of Regina. The responsible operator, under scrutiny from this branch, acted promptly and efficiently in the clean-up, thus averting unnecessary environmental damage.

## Petroleum Statistics Branch

The Petroleum Statistics Branch is responsible for providing accurate statistics on all oil, gas and water production and disposition from each well in Saskatchewan as well as evaluating the wellhead price of all oil and gas. The branch is also responsible for administering two crude oil pricing programs funded by the federal government and a program for sharing the export tax revenue on crude oil exports from the province between the export tax revenue on crude oil exports from the province between the Governments of Canada and Saskatchewan. Accurate and timely statistics are vital for sound resource management, policy decisions, detailed reservoir enginering studies,

enforcement of good production, conservation and engineering standards, evaluation of Crown lands under disposition, and revenue auditing functions.

In particular, the branch:

- collects, validates, processes, stores and disseminates data related to production and disposition of crude oil, natural gas and water in the province.
- manages a system of computer programs which record and validate production and disposition data submitted by operators.
- implements a program to audit production and disposition data against data contained in returns submitted by purchasers, transporters, and receivers of the product of production.
- validates production and related data used by operators in calculating the amount of royalty and tax revenue accruing to the province on crude oil and natural gas production.
- conducts detailed analysis of wellhead prices of Saskatchewan crude oil and delivered price to specific markets.
- analyses, develops and administers a program for sharing the export charge revenue on crude oil exports from the province between the Governments of Canada and Saskatchewan as provided for in the National Energy Program.
- administers the New Oil Reference Price (NORP) program funded by the Government of Canada to provide world prices for conventional new oil produced in Saskatchewan beginning January 1, 1982.
- administers the Special Old Oil Price (SOOP) program funded by the Government of Canada to provide a special price equivalent to the world price for certain categories of oil discovered after 1973, but which do not receive the New Oil Reference Price;
- gathers and analyses statistics on the production and consumption of energy in Saskatchewan for publication in the Saskatchewan Energy Flow Accounts.
- prepares for publication the Monthly Oil and Gas Report, The Drilling Activity Report, and the Mineral Statistics Yearbook.
- handles internal and external requests for crude oil, natural gas and water statistic in various formats.

Given the vital role of petroleum statistics in a dynamic oil and gas industry, the production and disposition system which records, validates and stores data submitted by approximately 225 operators averaging in excess of 6,000 individual reports each month over 15,200 active oil, gas and service wells must be able to respond to a broad range of user requirements for timely and accurate statistics. During the fiscal year, the branch has evaluated and implemented a number of modifications and improvements to existing computer programs aimed at increasing system capability and efficiency to accommodate the additional needs of both external and internal users.

The wellhead price of crude oil is one of several variables in a formula used to calculate royalty and tax revenues on crude oil production. The branch continues to analyse and monitor more precisely the determination of the wellhead price for crude oil — the posted price at a field terminal less reasonable allowance for transportation from wellhead to the point of sale. This is particularly important given the rapid escalation of transportation charges compared to the more gradual and regulated increases in the wellhead price of crude oil

Two oil pricing programs funded by the federal government are administered by the branch. The New Oil Reference Price (NORP) program, in effect since January 1, 1982 provides world prices for conventional new oil produced from approximately 3,000 wells or about 26 percent of provincial oil production at fiscal year end. The Special Old Oil Price (SOOP) effective July 1, 1982 granted 75 percent of the world price for certain categories of oil including oil discovered after 1973, all heavy oil and oil from marginal producing wells. Effective July 1, 1983, an amendment to the Canada-Saskatchewan Energy Pricing and Taxation Agreement granted all SOOP oil eligibility for the full world price. As of March 31, 1984, over 7,000 wells representing approximately 60 percent of provincial oil production received the full world price. These two programs together returned to both oil producers and the province a gross additional revenue in excess of $155 million during the fiscal year.

During the fiscal year the branch completed a major review and assessment of a significant number of wellhead crude oil analyses collected through the two crude oil pricing programs. This effort has led to the establishment of average crude oil qualities for most pools in the province and has resulted in a more equitable approach to provide world pricing to 60 percent of the province's oil production.

A review of the administrative/financial procedures for sharing the crude oil export tax revenues between the National Energy Board, Alberta, Manitoba, British Columbia and Saskatchewan came to a successful conclusion in October, 1983 after Saskatchewan initiated the request for a review more than one and a half years earlier. The revised sharing procedures brought an additional $6.9 million to the province. The branch continues to administer and monitor the sharing procedures to ensure the province's continued fair share of the export tax revenue which currently averages approximately $5.5 million monthly.

The branch participated in the ongoing design and development of the proposed revenue billing system both internally and with industry associations. The direct billing system is expected to be implemented on April 1, 1985.